Exhibit A

What size concrete slab can hold 90,000 lbs?

8 Answers

Frank Robertson, Construction, Farming, Art (1979-present)
Answered 3 years ago · Author has **3.3K** answers and **6.3M** answer views

This is an incomplete question. You have to know the weight of the load expressed in an area to determine the size foundation or stab that will support it. A concentrated load of 90,000 lbs in one square inch, or even a square foot, is much different than a distributed 90,000 lb load over 1000 square feet.

That being as it may, concrete is rated in pounds per square inch, and soil is characterized by pounds per square foot in soil bearing capacity, so when you design the slab, calculate the soil bearing capacity (1500 lbs per square foot is nominal), divide the total load (plus the weight of the concrete involved in the supporting structure), and you should have an area something like 60 square feet (again, you have to allow for the concrete weight later on), so with the 3000 psi concrete, guessing 12 inches thick, weighing in at about 10,000 pounds, you are up to around 68 square feet...or a slab roughly 8 feet long, 8 feet wide, and 12 inches thick.

Here is the reality. The above method of calculation isn't exact, the numbers are off the top of my head... and in the real world, 90,000 pounds sounds like a lot of weight, but distributed correctly, with no dynamic load, shear, or other forces applied to it, common dirt will support the weight. Slab and foundation design needs to, really needs to, be done by a qualified structural engineer who understands the complex forces applied by static and dynamic loads for a really accurate answer.

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Paul Clare, BSc(Hons) CEng MCIHT MIAT Civil and Structural Engineering, University of Manchester Institute of Science and...
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It depends on how the slab is supported and the required length and width. Is it a cantilever like a diving board or is the slab supported around the edges like a manhole cover? Is the load spread out or acting on a single point? Is it 90,000lbs of gold bullion or 90,000lbs of feathers?

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more though needs to go into the question to get a reasonable answer.

to show how ridiculous the question is, an answer to it is as follows: a two way slab of 1 inch thick unreinforced is sufficient if it is only spanning 1 inch and the load was uniformly distributed.

forget about trucks and PSI of the concrete, just think about what you want and ask a reasonably thought out question.

7K views

Brian Dahlquist, I read about something somewhere at sometime or heard about

Updated October 7, 2021 · Author has **68** answers and **20.3K** answer views

A slab with the dimensions of 100′ x 50′ x 18″, 4500 lb. concrete, reinforced with a double layer of #6 bars 12″ OC. should do it. Make sure it has a nice smooth broom finish.

You can park a plane it.

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What is the approximate load on a 4" concrete slab?

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How much weight can a concrete driveway hold?

How thick should concrete be to support a loaded truck?

Joo Sum Lee, Chartered Structural Engineer (1990-present)

Answered July 9, 2021 · Author has **205** answers and **113.3K** answer views

90,000 lbs = 40 tons about the weight of an articulated trucks. If load is static then it is a direct foundation type calculations, check that the bearing pressure is within its allowable bearing pressure. If it is a moving load then dynamic factor has to be multiply to the load, which is dependent on the speed of the moving load. The higher the speed, the higher the dynamic factor.

1.1K views

Raymond Crane, MS Structural Engineering & Civil Engineering, University of Sheffield (1977)

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Meaningless question. Re-phrase with specific information such as:-

Is the slab suspended or on grade?

What is the configuration of the 90,000 lbs load?

Etc etc

450 views

David Ventsias
Answered 2 years ago

It sounds like you are asking what thickness and PSI strength is needed to hold a fully loaded Semi-truck and Trailer. If that's the case, it takes some math, and the numbers will be slightly fudged as the weight is not perfectly distributed to each wheel, but you can get it close, and I would say that the answer before we begin is going to come out to be that you will need 5,000 PSI Exterior concrete, poured to a thickness of at minimal 6 inches, at 6 inches it may crack, 8" is better of course.

3 calculations needed:

1. Find surface area of each wheel: for math purposes use simple numbers: say 12" wide wheel and 6" thickness is touching the ground. 12" x 6"= 1 x .5 = .5 SF touching ground, times 18 wheels = 9 SF touching the ground.

2. 9 SF divided by 90,000 pounds = 10,000 pounds per square foot

3. 10,000 pounds divided by 12 inches = 833 psi , pounds per square inch pressing down (seems like 5,000 PSI would cover it)

Not sure If I am correct, that calculation seems to be kindof low, check the math, maybe the tires don't touch the ground a full 6", maybe they only touch the ground 5 or 4 inches, also maybe the width of the tire is 11.5 inches and not 12, so both those factors would make the pounds per square inch exterted much greater than 833.

You have figure out how much surface area is going to be pressing down on the ground, and divide that by how much weight.

I would just go with the 5,000 PSI concrete with 8" thickness and wire reinforced if you can afford it, but it looks to be that a 5,000 PSI with 6" thickness and wire reinforced should hold the weight and not crack if left to cure properly for the 30 days needed. (You'll Also need a minimum of 5 inches of crushed stone aggregate base for underneath, and of course 10" is better, compacted in 3 inch lifts)

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Ian Marr, Architect
Answered 1 year ago · Author has **377** answers and **135.6K** answer views

There are two ways to look at this:

1. A surface that needs to hold something like a 90,000lb vehicle rolling along. Or.
2. A 90,000lb concentrated load coming down such as a column.

For the first scenario, you need something like 8"-12" thick reinforced concrete. Conditions below the slab generally define the difference.

For the second scenario, you probably don't want the slab supporting this load. You really want a pad footing designed for this.

6.7K views

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Lindsey Philpott, former Forensic Engineer (2003-2017)
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How thick does a concrete slab need to be for a garage?

How thick does a concrete slab need to be for a (residential?) garage? Depending on the condition of the sub-grade (the rocky base material on which the slab is poured) a normal (residential) garage slab should be at least 4-inches deep (100 mm). If the

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James Flack, Growing our own food for taste, pleasure and saving money
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How much weight can a 4-thick concrete slab withstand?

For a given slab thickness, strength depends on:

The mix of concrete used- ratio of cement to sand to gravel, size of gravel, and any additives

Reinforcement- re-enforced concrete is stronger.

The foundations- clearly a slab poured onto solid rock just to create a level platform will be much stronger than one sitting straight on loose soil!

Water- too much water when mixing makes it weaker, but letting it dry out before fully cured also makes it weaker. For optimal strength, it needs to be just wet enough, but for long enough.

So it depends.

Also 4 isn't a useful unit....4 inches, 4 foot, 4 meters?

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Frank Robertson, Construction, Farming, Art (1979-present)
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How thick should a concrete slab be to hold a 75000 pound truck?

How thick should a concrete slab be to support a heavy truck? There are a couple of considerations on how thick the concrete should be. Is it reinforced, and if so, with what reinforcing? What is the bearing capacity of the sub grade the concrete is resting on? And how many wheels is the truck's weight distributed onto? Given an average tractor trailer truck, with 18 pretty large wheels, on unreinforced concrete placed on a good, dense, solid subgrade, 6 inches of concrete would hold the distributed load easily. Put the same load and concrete on soft bearing material, and the slab would likely fail, and worse, if you make the concrete thicker to offset the weakness of the subgrade, even the thicker concrete may fail, since even though the concrete is thicker, so you could think stronger, the weak subgrade is under even more load that it cannot handle.

When you think about heavy loads, it is important to think about weight distribution. If a truck tire has a 12 inch by 12 inch footprint of rubber in contact with the ground, and there are 144 square inches in that space, and it has 18 such wheels, the actual load the truck is applying on the surface is only about 30 pounds per square inch of

soft mud or sand, or is it solid hard clay or crushed limestone?

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Eric Elford

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Can I pour a 2-inch concrete slab?

Yes? I mean concrete comes in various formats from pourage like soup to rocky rocky muck. Hardly technical, I realize. But you can request what you want from the concrete company and they will deliver it.

Or you can buy bags of it and mix it yourself.

I would give some thought to adding some wire mesh though, as 2" is pretty thin and it's going to crack.

3.3K views · View upvotes · Answer requested by Ayesha Fatima

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Related Answer

Frank Robertson, Construction, Farming, Art (1979-present)

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What is the minimum thickness for a heavy equipment slab?

How thick a heavy equipment slab is depends on the actual weight of the equipment, how dynamic it is, and how stable the subgrade is, as well as the reinforcement and compressive strength of the concrete used. For normal use with a good subgrade and

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Bradford White, Engineer Specializing in HVAC and Energy (1977-present)

Answered 2 years ago · Author has **2.9K** answers and **2.3M** answer views

Why is common concrete rated for 4000 psi when a car only puts a maximum of 30 psi onto a driveway?

Concrete is specified and selected for a wider variety of properties such as impermeability of water, abrasion resistance, mass, hardness and the like.

A driveway could be made of asphalt, crushed stone, compacted or loose soil and still hold up a vehicle. When wet, the soil's ability to support weight is severely diminished in most cases.

So normal concrete, rated at least 3,000 PSI and higher as you note, just has a higher and more predictable compression strength, plus the ability to spread that weight out over less supportive sub-soils.

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Frank Robertson, Construction, Farming, Art (1979-present)

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What is the thickness and grade of concrete for a 40 ton, loaded truck? concrete is only as strong as the subgrade or base material it is placed upon. If you have a good,

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Jeff Robbert, Civil Engineer

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How thick should concrete be to support a loaded truck?

Most sidewalk is 4 inch thick. Driveways are 6 inches. Commercial driveway near dumpsters or other areas that would expect trucks would be 8 or 9 inches with wire mesh at the bottom.

If anywhere in the US (or most developed countries), the state or local municipality will have design standards requiring a depth of concrete. Just go with the standard.

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Michael L Car'denas, studied at School of Hard Knocks

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How do you calculate whether a concrete slab can support a load?

3 types of load are considered while designing slab:

1)Dead load of the slab

2) Live load of the slab

3)Finished floor load

Dead Load:Self weight of the slab=mass/weight of the slab I.e.density *Area.

As we KNOW that density of reinforced concrete is 25kn/3.

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Richard Morris, former Electrical Engineer/Mechanic at Work for Bureau of Reclamations (1985-1997)

Answered 3 years ago · Author has **417** answers and **372.1K** answer views

How many tons can a concrete road with 3,000 psi hold?

Originally Answered: How many tons can a concrete road with 3,000 psi hold?

How many tons on 3000 lb/sq/inch will be 1.5 tons per square inch? That 1.5 tons would have to be placed precisely in the center of the 1.5 load on that one square inch of concrete, and I mean accurately if it isn't positioned correctly that one square inch of concrete will decinergrate immediately.

Basically, 3000 psi is the flat slab of a home that has the dimension WxLxD (about 6").

1

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How thick does a concrete slab have to be to hold a car?

How thick should a concrete slab be?

What is a concrete slab on grade?